

**WHAT IS CLAIMED IS:**

1. A luminous display device with an increased active display area, comprising:
  - 5 a first and second circular plates fused at an outer edge and having an overall diameter ( $D_O$ );
  - a recess provided on an inner surface of at least one of the first and second plates to define an active display portion having a diameter ( $D_A$ ) surrounded by an outer rim with a width ( $W$ );
  - 10 a layer of beads held in position in the recess by the first and second fused plates and the outer rim;
  - an ionizable gas filling a volume of the recess around the layer of beads;
  - an electrode in communication with the ionizable gas; and
  - a power supply for providing a high frequency voltage applied to the electrode for
  - 15 creating a lightning-like effect, which is visible in the active display portion of the recess, in the ionizable gas as multiple discharge paths through the layer of beads;
  - wherein the diameter ( $D_A$ ) of the active display is defined by  $D_O - 2W$  and is at least 90% of the overall diameter ( $D_O$ ).
- 20 2. The device as recited in Claim 1, wherein the width ( $W$ ) of the outer rim falls within a range of .35 to .6 inches.
3. The device as recited in Claim 1, wherein the layer of beads is coated with a colored phosphorescent material.
- 25 4. The device as recited in Claim 1, wherein the layer of beads is coated with a plurality of colored phosphorescent materials.
5. The device as recited in Claim 1, wherein a housing of the power supply
- 30 has a circular shape.

6. The device as recited in Claim 5, wherein the housing of the power supply is symmetrically fixed at a center of one of the first and second plates.

7. The device as recited in Claim 1, wherein a diameter of each of the beads  
5 substantially equals a height of the recess.

8. The device as recited in Claim 1, wherein each plate has a recess.

9. A method of providing a luminous display device with an increased active  
10 display area, comprising:

providing a first and second circular plates having an overall diameter ( $D_O$ );

creating a recess on an inner surface of at least one of the first and second plates to define an active display portion having a diameter ( $D_A$ ) surrounded by an outer rim with a width ( $W$ );

15 filling the recess with a layer of beads;

fusing the first and second plates to each other at an outer edge thereof;

filling a volume of the recess around the layer of beads with an ionizable gas;

installing an electrode in communication with the ionizable gas; and

providing a high frequency voltage applied to the electrode for creating a  
20 lightning-like effect, which is visible in the active display portion of the recess, in the ionizable gas as multiple discharge paths through the layer of beads;

wherein the diameter ( $D_A$ ) of the active display is defined by  $D_O - 2W$  and is at least 90% of the overall diameter  $D_O$ .

25 10. The method as recited in Claim 9, wherein the width ( $W$ ) of the outer rim falls within a range of .35 to .6 inches.

11. The method as recited in Claim 9, further comprising the step of coating the layer of beads with a colored phosphorescent material.

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12. The method as recited in Claim 9, further comprising the step of coating the layer of beads with a plurality of colored phosphorescent materials.

13. The method as recited in Claim 9, further comprising the step of creating a  
5 recess in both plates.

14. A luminous display device with an increased active display area, comprising:

10 a first and second circular plates fused at an outer edge and having an overall radius ( $r_o$ );

a recess provided on an inner surface of at least one of the first and second plates to define an active display portion having a radius ( $r_a$ ) surrounded by an outer rim;

a layer of beads held in position in the recess by the first and second fused plates and the outer rim;

15 an ionizable gas filling a volume of the recess around the layer of beads;

an electrode in communication with the ionizable gas; and

a power supply for providing a high frequency voltage applied to the electrode for creating a lightning-like effect, which is visible in the active display portion of the recess, in the ionizable gas as multiple discharge paths through the layer of beads;

20 wherein the active display area is defined by ( $A_A = \pi r_a^2$ ) and is at least 75-80% of an overall display area defined by ( $A_O = \pi r_o^2$ ).

15. The device as recited in Claim 14, wherein the layer of beads is coated with a colored phosphorescent material.

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16. The device as recited in Claim 14, wherein the layer of beads is coated with a plurality of colored phosphorescent materials.

17. The device as recited in Claim 14, wherein a housing of the power supply  
30 has a circular shape.

18. The device as recited in Claim 17, wherein the housing of the power supply is symmetrically fixed at a center of one of the first and second plates.

19. The device as recited in Claim 1, wherein a diameter of each of the beads  
5 substantially equals a height of the recess.

20. The device as recited in Claim 1, wherein each plate has a recess.